

=> s rhombohed M.sub.2xo.sub.4

179 RHOMBOHEDRAL  
331713 M  
55689 SUB  
7 2XO  
55689 SUB  
2320147 4  
L2 0 RHOMBOHEDRAL M.SUB.2XO.SUB.4  
(RHOMBOHEDRAL(W)M(W)SUB(W)2XO(W)SUB(W)4)

=> file ca

| COST IN U.S. DOLLARS | SINCE FILE ENTRY | TOTAL SESSION |
|----------------------|------------------|---------------|
| FULL ESTIMATED COST  | 11.10            | 11.25         |

FILE 'CA' ENTERED AT 12:59:04 ON 31 JAN 1998  
USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.  
PLEASE SEE "HELP USAGETERMS" FOR DETAILS.  
COPYRIGHT (C) 1998 AMERICAN CHEMICAL SOCIETY (ACS)

Copyright of the articles to which records in this database refer is held by the publishers listed in the PUBLISHER (PB) field (available for records published or updated in Chemical Abstracts after December 26, 1996), unless otherwise indicated in the original publications.

FILE COVERS 1967 - 27 Jan 1998 (980127/ED) VOL 128 ISS 5

This file contains CAS Registry Numbers for easy and accurate substance identification.

=> s 11

6860 RHOMBOHEDRAL  
627 NASICON  
L3 5 RHOMBOHEDRAL NASICON  
(RHOMBOHEDRAL(W)NASICON)

=> d 13 1-5

L3 ANSWER 1 OF 5 CA COPYRIGHT 1998 ACS  
AN 128:5716 CA  
TI Cathode materials for secondary alkali metal-ion and lithium-ion batteries  
IN Goodenough, John B.; Padhi, Akshaya; Nanjundaswamy, K. S.; Masquelier, Christian  
PA Board of Regents, the University of Texas System, USA  
SO PCT Int. Appl., 47 pp.  
CODEN: PIXXD2  
PI WO 9740541 A1 971030  
DS W: CA, JP  
RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE  
AI WO 97-US6671 970423  
PRAI US 96-16060 960423  
US 96-32346 961204  
DT Patent  
LA English

L3 ANSWER 2 OF 5 CA COPYRIGHT 1998 ACS  
AN 124:239799 CA  
TI Preparation of NASI glasses by sol-gel process  
AU Kim, Hee-Ju; Kang, Eun-Tae; Kim, Jong-Ock

CS Dep. Inorg. Mater. Eng., Gyeongsang Natl. Univ., S. Korea  
SO Yoon Hakhoeoni (1995), 32(12), 1357-68  
CODEN: YPHJAP; ISSN: 0372-7807  
DT Journal  
LA Korean

L3 ANSWER 3 OF 5 CA COPYRIGHT 1998 ACS  
AN 115:238022 CA  
TI Structure and lithium(1+) dynamics lithium zirconium phosphate  
[LiZr<sub>2</sub>(PO<sub>4</sub>)<sub>3</sub>] ceramics  
AU Petit, Dominique; Chaput, Frederic; Boilot, Jean Pierre  
CS Lab. Phys. Martiere Condens., Ec. Polytech., Palaiseau, 91128, Fr.  
SO Mater. Sci. Monogr. (1991), 66C(Ceram. Today--Tomorrow's Ceram., Pt.  
C), 2275-83  
CODEN: MSMODP; ISSN: 0166-6010  
DT Journal  
LA English

L3 ANSWER 4 OF 5 CA COPYRIGHT 1998 ACS  
AN 110:125971 CA  
TI Sodium and oxygen disorder in a scandium-substituted NASICON: a  
time of flight neutron powder diffraction study of  
Na<sub>2.5</sub>Zr<sub>1.8</sub>Sc<sub>0.2</sub>Si<sub>1.3</sub>P<sub>1.7</sub>O<sub>12</sub>  
AU Squattrito, Philip J.; Rudolf, Philip R.; Hinson, Paul G.;  
Clearfield, Abraham; Volin, Kenneth; Jorgensen, James D.  
CS Dep. Chem., Texas A and M Univ., College Station, TX, 77843, USA  
SO Solid State Ionics (1988), 31(1), 31-40  
CODEN: SSIOD3; ISSN: 0167-2738  
DT Journal  
LA English

L3 ANSWER 5 OF 5 CA COPYRIGHT 1998 ACS  
AN 103:90522 CA  
TI **Rhombohedral Nasicon** compound and battery  
IN Yoldas, Bulent E.; Lloyd, Isabel K.  
PA Westinghouse Electric Corp., USA  
SO U.S., 6 pp.  
CODEN: USXXAM  
PI US 4526844 A 850702  
AI US 83-485087 830414  
DT Patent  
LA English

=> d 13 1-5 ab

L3 ANSWER 1 OF 5 CA COPYRIGHT 1998 ACS  
AB The cathode materials are LiMPO<sub>4</sub>, where M is .gtoreq.1 1st-row  
transition-metal cation; Mn, Fe, Co, and/or Ni; or Fe<sub>1-x</sub>M<sub>x</sub> or  
Fe<sub>1-x</sub>Ti<sub>x</sub>, where 0 < x < 1. The cathode materials comprise a  
**rhomboidal Nasicon** material M<sub>1</sub>xM<sub>2</sub>(PO<sub>4</sub>)<sub>3</sub>, where  
M<sub>1</sub> is Li or Na and x .ltoreq.5.

L3 ANSWER 2 OF 5 CA COPYRIGHT 1998 ACS  
AB Nasicon gels (nasigels) of compn. Na<sub>0.75</sub>Zr<sub>2</sub>PSi<sub>2</sub>O<sub>12</sub> and Na<sub>3</sub>Zr<sub>2</sub>PSi<sub>2</sub>O<sub>12</sub>  
have been synthesized by the sol-gel technique using metal alkoxide  
precursors. Crack-free monolithic dry Na<sub>0.75</sub>Zr<sub>2</sub>PSi<sub>2</sub>O<sub>12</sub> gels have  
been prep'd. by the controlling the shrinkage rate, but gels of  
Na<sub>3</sub>Zr<sub>2</sub>PSi<sub>2</sub>O<sub>12</sub> were impossible to prep. without cracking. The gels  
treated at up to 800.degree.C led to the formation of glass but the  
glasses were converted to the cryst. phases at above this temp.  
Cryst. phases pptd. from the Na<sub>0.75</sub>Zr<sub>2</sub>PSi<sub>2</sub>O<sub>12</sub> glass were a  
NASICON-like phase, Na<sub>2</sub>Si<sub>2</sub>O<sub>5</sub>, and free ZrO<sub>2</sub>. The only phase that  
pptd. from the Na<sub>3</sub>Zr<sub>2</sub>PSi<sub>2</sub>O<sub>12</sub> gel was **rhomboidal**  
**NASICON**. For Na<sub>0.75</sub>Zr<sub>2</sub>PSi<sub>2</sub>O<sub>12</sub> gels, a framework of PO<sub>4</sub>

tetrahedra and  $\text{SiO}_4(\text{PO}_4)$  tetrahedra formed at low temp. but changed to that of  $\text{SiO}_4$  and  $\text{SiO}_4(\text{PO}_4)$  tetrahedra at high temp. In the case of  $\text{Na}_3\text{Zr}_2\text{PSi}_2\text{O}_{12}$  gel, a framework of isolated  $\text{PO}_4$  and  $\text{SiO}_4$  tetrahedra formed at low temp. but changed to  $\text{SiO}_4(\text{PO}_4)$  tetrahedra framework which usually formed in the NASICON crystal after crystn. at high temp. The gels treated at up to 800.degree.C contained residual water. The ionic conduction was attributed to the motion of proton and  $\text{Na}^+$  ions at low (150-200.degree.C) and higher temps., resp. As the temp. of heat treatment increased, ionic cond. gradually increased with increasing extent of pptn. of cryst. phases.

L3 ANSWER 3 OF 5 CA COPYRIGHT 1998 ACS

AB Structure, phase transition, and Li motion in pure and Ta-doped  $\text{LiZr}_2(\text{PO}_4)_3$  ceramics were studied by x-ray diffraction, DSC, NMR ( $^3\text{IP}$  and  $^7\text{Li}$ ) and a.c. cond. For pure **rhombohedral NASICON**-type ceramics, the bulk cond. was 0.014 S/cm at 300.degree., while the total cond. (bulk plus grain boundaries) was  $5 \times 10^{-4}$  S/cm for pure .beta.- $\text{Fe}_2(\text{SO}_4)_3$ -type ceramics. Ta-doped materials with the **rhombohedral NASICON** structure showed lower conductivities comparable to undoped ceramics.

L3 ANSWER 4 OF 5 CA COPYRIGHT 1998 ACS

AB A Sc-substituted NASICON of compn.  $\text{Na}_{2.5}\text{Zr}_{1.8}\text{Sc}_{0.2}\text{Si}_{1.3}\text{P}_{1.7}\text{O}_{12}$  has been prepd. and characterized by neutron powder diffraction and cond. measurements. Time-of-flight neutron powder diffraction data were collected at 26, 100, 200, 300, and 400.degree.. Satisfactory Rietveld refinements were obtained for all temps. using the rhombohedral space group  $R\bar{3}m$ . The novel aspect of this structure is the simultaneous presence of partially occupied interstitial sodium and oxygen sites that are disordered with the regular  $\text{Na}(2)$  and  $\text{O}(1)$  sites in the known **rhombohedral NASICON** structure. The results are compared with recent findings of defect structures in other NASICON materials. Cond. measurements in the range 30-350.degree. reveal an activation energy of 0.30 eV for  $\text{Na}^+$  conduction but cond. values changed with temp. of sample prepn.

L3 ANSWER 5 OF 5 CA COPYRIGHT 1998 ACS

AB The title compd. is  $\text{M}_1x+0.02y+0.04z\text{M}_2-0.02(y+z)\text{M}_3-0.02z\text{M}_4x\text{M}_5-3-x\text{O}_{12}$ ; where M is selected from Li, Na, Ca, and Ag;  $\text{M}_1$  is selected from Zr, Ti, or Hf;  $\text{M}_2$  is selected from Y, Sc, or La;  $\text{M}_3$  is selected from Mg, Ca, Sr, or Ba;  $\text{M}_4$  is selected from Si and Ge;  $\text{M}_5$  is selected from P and As;  $x = 1.6-2.2$ ;  $y$  .ltorsim.15; and  $z$  .ltorsim.15. The preferred compd. is  $\text{Na}_{1+x}\text{Zr}_2\text{Si}_x\text{P}_3-x\text{O}_{12}$ . A Na-S battery using the Nasicon compd. is also disclosed. The Nasicon compds. are prepd. by chem. polymn. from alkoxide solns. Thus,  $\text{Na}_3\text{Zr}_2\text{Si}_2\text{P}_3\text{O}_{12}$  was prepd. from  $\text{NaOEt}$  [141-52-6],  $\text{Zr}(\text{OBu})_4$  [1071-76-7],  $\text{Si}(\text{OEt})_4$  [78-10-4], and  $\text{P}(\text{OMe})_3$  [121-45-9]. The resp. cond. of Nasicon according to the invention at 300 and .apprx.25.degree. was 4.02 .times.  $10^{-3}$  and 1.22 .times.  $10^{-5}/\text{OMEGA}\cdot\text{cm}$ ; these values were superior to those of the ref. samples.

=> s 13 and cathode#

96038 CATHODE#

L4 1 L3 AND CATHODE#

=> d 14

L4 ANSWER 1 OF 1 CA COPYRIGHT 1998 ACS

AN 128:5716 CA

L5 ANSWER 1 OF 1 USPATFULL  
 AN 85:38809 USPATFULL  
 TI **Rhombohedral nasicon** compound and battery  
 IN Yoldas, Bulent E., Murrysville, PA, United States  
 Lloyd, Isabel K., Murrysville, PA, United States  
 PA Westinghouse Electric Corp., Pittsburgh, PA, United States (U.S. corporation)  
 PI US 4526844 850702  
 AI US 83-485087 830414 (6)  
 DT Utility  
 LN.CNT 378  
 INCL INCLM: 429/030.000  
 INCLS: 429/033.000; 429/193.000; 501/103.000; 501/104.000;  
 501/106.000  
 NCL NCLM: 429/030.000  
 NCLS: 429/033.000; 429/193.000; 501/103.000; 501/104.000;  
 501/106.000  
 IC [3]  
 ICM: H01M008-10  
 ICS: H01M006-18  
 EXF 429/193; 429/30; 429/31; 429/33; 501/103; 501/104; 501/106  
 CAS INDEXING IS AVAILABLE FOR THIS PATENT.

=> d 15 ab

L5 ANSWER 1 OF 1 USPATFULL  
 AB Disclosed is a nasicon compound and a method of making it. The nasicon compound is rhombohedral at room temperature and has the general formula

$$M_{1+x+0.02y+0.04z} M'_{2-0.02(y+z)} M''_{0.02y} M'''_{0.02z} M''''_{x} M'''''_{3-x} O_{12}$$

where M is selected from lithium, sodium, calcium, and silver, M' is selected from zirconium, titanium or hafnium, M'' is selected from yttrium, scandium or lanthanum, M''' is selected from magnesium, calcium, strontium or barium, M'''' is selected from silicon and germanium, M''''' is selected from phosphorous and arsenic, x is about 1.6 to about 2.2, y is about 0 to about 15, and z is about 0 to about 15. The preferred compound is

$$Na_{1+x} Zr_{2} Si_x P_{3-x} O_{12}$$

A sodium sulfur battery using the nasicon compound is also disclosed.

TI Cathode materials for secondary alkali metal ion and  
 lithium-ion batteries  
 IN Goodenough, John B.; Padhi, Akshaya; Nanjundaswamy, K. S.;  
 Masquelier, Christian  
 PA Board of Regents, the University of Texas System, USA  
 SO PCT Int. Appl., 47 pp.  
 CODEN: PIXXD2  
 PI WO 9740541 A1 971030  
 DS W: CA, JP  
 RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT,  
 SE  
 AI WO 97-US6671 970423  
 PRAI US 96-16060 960423  
 US 96-32346 961204  
 DT Patent  
 LA English

=> file uspat

|  |                  |               |
|--|------------------|---------------|
| COST IN U.S. DOLLARS                       | SINCE FILE ENTRY | TOTAL SESSION |
| FULL ESTIMATED COST                        | 13.96            | 25.21         |
| DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS) | SINCE FILE ENTRY | TOTAL SESSION |
| CA SUBSCRIBER PRICE                        | -2.30            | -2.30         |

FILE 'USPATFULL' ENTERED AT 13:00:24 ON 31 JAN 1998  
 CA INDEXING COPYRIGHT (C) 1998 AMERICAN CHEMICAL SOCIETY (ACS)

FILE COVERS 1971 TO PATENT PUBLICATION DATE: 27 Jan 1998 (19980127/PD)  
 FILE LAST UPDATED: 28 Jan 1998 (19980128/ED)  
 HIGHEST PATENT NUMBER: US5713075  
 CA INDEXING IS CURRENT THROUGH 28 Jan 1998 (19980128/UPCA)  
 ISSUE CLASS FIELDS (/INCL) CURRENT THROUGH: 27 Jan 1998 (19980127/PD)  
 REVISED CLASS FIELDS (/NCL) LAST RELOADED: JAN 1998  
 USPTO MANUAL OF CLASSIFICATIONS THESAURUS ISSUE DATE: DEC 1997

>>> Page images are available for patents from 1/1/94. Current <<<  
 >>> week patent text is typically loaded by Thursday morning and <<<  
 >>> page images are available for display by the end of the day. <<<  
 >>> Image data for the /FA field are available the following week. <<<

>>> Complete CA file indexing for chemical patents (or equivalents) <<<  
 >>> is included in file records. A thesaurus is available for the <<<  
 >>> USPTO Manual of Classifications in the /NCL, /INCL, and /RPCL <<<  
 >>> fields. This thesaurus includes catchword terms from the <<<  
 >>> USPTO/MOC subject headings and subheadings. Thesauri are also <<<  
 >>> available for the WIPO International Patent Classification <<<  
 >>> (IPC) Manuals, editions 1-6, in the /IC1, /IC2, /IC3, /IC4, <<<  
 >>> /IC5, and /IC (/IC6) fields, respectively. The thesauri in <<<  
 >>> the /IC5 and /IC fields include the corresponding catchword <<<  
 >>> terms from the IPC subject headings and subheadings. <<<

This file contains CAS Registry Numbers for easy and accurate  
 substance identification.

=> s 11

662 RHOMBOHEDRAL  
 120 NASICON  
 L5 1 RHOMBOHEDRAL NASICON  
 (RHOMBOHEDRAL(W)NASICON)

=> d 15

=> s Mn or Fe or Co or Ni

248414 MN  
388004 FE  
194422 CO  
226832 NI  
L10 633856 MN OR FE OR CO OR NI

=> s 19 and 110

L11 1 L9 AND L10

=> file ca

| COST IN U.S. DOLLARS | SINCE FILE ENTRY | TOTAL SESSION |
|----------------------|------------------|---------------|
| FULL ESTIMATED COST  | 101.48           | 101.63        |

FILE 'CA' ENTERED AT 12:23:07 ON 31 JAN 1998  
USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.  
PLEASE SEE "HELP USAGETERMS" FOR DETAILS.  
COPYRIGHT (C) 1998 AMERICAN CHEMICAL SOCIETY (ACS)

Copyright of the articles to which records in this database refer is held by the publishers listed in the PUBLISHER (PB) field (available for records published or updated in Chemical Abstracts after December 26, 1996), unless otherwise indicated in the original publications.

FILE COVERS 1967 - 27 Jan 1998 (980127/ED) VOL 128 ISS 5

This file contains CAS Registry Numbers for easy and accurate substance identification.

=> s 111

L12 2 L11

=> d 112 1-2

L12 ANSWER 1 OF 2 CA COPYRIGHT 1998 ACS  
AN 97:24305 CA  
TI Carboxylate and sulfonate polyaddition polymers  
AU Katayama, S.; Koyama, N.; Iwashita, T.  
CS Polym. Res. Lab., NHK Spring Co. Ltd., Yokohama, Japan  
SO Int. Prog. Urethanes (1981), 3, 15-32  
CODEN: IPURD9; ISSN: 0147-0671  
DT Journal  
LA English

L12 ANSWER 2 OF 2 CA COPYRIGHT 1998 ACS  
AN 94:122000 CA  
TI Carboxylate and sulfonate polyaddition polymers  
AU Katayama, Shitomi; Koyama, Nobuaki; Iwashita, Takeyasu  
CS Dep. Res. Dev., NHK Spring Co., Ltd., Japan  
SO Plast. Ind. News (1980), 26(12), 182-9  
CODEN: PINWAE; ISSN: 0032-1206  
DT Journal



L12 ANSWER 1 OF 2 CA COPYRIGHT 1998 ACS

ACCESSION NUMBER: 97:24305 CA

TITLE: Carboxylate and sulfonate polyaddition polymers

AUTHOR(S): Katayama, S.; Koyama, N.; Iwashita, T.

CORPORATE SOURCE: Polym. Res. Lab., NHK Spring Co. Ltd., Yokohama, Japan

SOURCE: Int. Prog. Urethanes (1981), 3, 15-32

CODEN: IPURD9; ISSN: 0147-0671

DOCUMENT TYPE: Journal

LANGUAGE: English

CLASSIFICATION: 35-5 (Chemistry of Synthetic High Polymers)

Section cross-reference(s): 36

## ABSTRACT:

The title polyaddn. polyelectrolytes were prepd. by treating .beta.-propiolactone or propanesulfone with a diamine, hydroxyalkyl- or hydroxyalkarylamine, or bis(hydroxyalkyl)amine to give derivs. of .beta.-alanine or .gamma.-aminopropylsulfonic acid, which were then polymd. with a diisocyanate to give a polyurea, polyurea-polyurethane, or polyurethane. Polyurea electrolytes could be prepd. by both interfacial and soln. polymn., but polyurea-urethane and polyurethane electrolytes could be prepd. only by soln. polymn. The polyelectrolytes were sepd. into water-sol. and water-insol. fractions, both of which were sol. in aprotic polar solvents. Both the carboxylate and sulfonate polyelectrolytes had antistatic and flocculating properties. The carboxylate polyelectrolytes chelated metal ions in both water and DMSO, but the sulfonate polyelectrolytes exhibited no chelating ability.

SUPPL. TERM: polyurea polyelectrolyte prepn interfacial polymn;  
soln polymn polyurea polyelectrolyte prepn;  
polyurethane polyelectrolyte soln polymn; carboxy  
polyurea polyurethane polyelectrolyte; sulfo polyurea  
polyurethane polyelectrolyte

INDEX TERM: Flocculation  
(by carboxy or sulfonic group-contg.  
polyelectrolytes based on polyureas or  
polyurethanes)

INDEX TERM: Polyelectrolytes  
(carboxylic or sulfonic group-contg. polyureas or  
polyurethanes, prepn. and properties of)

INDEX TERM: Electric resistance  
(of carboxy or sulfonic group-contg. polyurea or  
polyurethane polyelectrolytes)

INDEX TERM: Chelation  
(of metals, by carboxy group-contg. polyurea or  
polyurethane polyelectrolytes)

INDEX TERM: Polyureas  
Urethane polymers, uses and miscellaneous  
ROLE: SPN (Synthetic preparation); PREP (Preparation)  
(carboxy group-contg., polyelectrolytes, prepn. and  
properties of)

INDEX TERM: Polymerization  
(interfacial, of carboxy or sulfonic group-contg.  
diamines, with diisocyanates, for polyelectrolytes)

INDEX TERM: Urethane polymers, uses and miscellaneous  
ROLE: SPN (Synthetic preparation); PREP (Preparation)  
(polyurea-, carboxy or sulfonic group-contg.,  
polyelectrolytes, prepn. and properties of)

INDEX TERM: Polyureas  
ROLE: SPN (Synthetic preparation); PREP (Preparation)  
(polyurethane-, carboxy or sulfonic group-contg.,

INDEX TERM: polyelectrolytes, prepn. and properties of)  
Polymerization  
(soln., of carboxy or sulfonic group-contg. hydroxy  
amines or diols, with diisocyanates, for  
polyelectrolytes)

INDEX TERM: Polyureas  
Urethane polymers, uses and miscellaneous  
(sulfonic group-contg., polyelectrolytes, prepn.  
and properties of)

INDEX TERM: 68147-06-8P 68147-08-0P 68147-22-8P 68147-26-2P  
68147-28-4P 68147-36-4P 68147-38-6P 68182-28-5P  
68182-29-6P 68253-12-3P 74182-29-9P 76961-33-6P  
76961-34-7P 76962-43-1P 76962-45-3P  
76962-49-7P 76962-53-3P 76962-54-4P  
76962-55-5P 82041-31-4P 82167-29-1P 82167-31-5P  
82167-33-7P  
ROLE: SPN (Synthetic preparation); PREP (Preparation)  
(polyelectrolytes, prepn. and properties of)

INDEX TERM: 1119-23-9P 4220-47-7P 5458-99-1P 27184-43-6P  
34381-72-1P 62155-79-7P 64645-91-6P 68147-35-3P  
71526-68-6P 76936-62-4P 76936-64-6P 76961-32-5P  
82055-97-8P 82055-98-9P 82055-99-0P  
ROLE: RCT (Reactant); SPN (Synthetic preparation);  
PREP (Preparation)  
(prepn. and polymn. of, with diisocyanates)

INDEX TERM: 57-57-8DP, diamine derivs. 1120-71-4DP, diamine  
derivs.  
ROLE: RCT (Reactant); SPN (Synthetic preparation);  
PREP (Preparation)  
(prepn. and polymn. of, with diisocyanates, for  
polyelectrolytes)

INDEX TERM: 124-09-4, reactions  
ROLE: RCT (Reactant)  
(reaction of, with Me methacrylate)

INDEX TERM: 104-10-9 111-42-2, reactions  
ROLE: RCT (Reactant)  
(reaction of, with acrylic acid)

INDEX TERM: 79-10-7, reactions  
ROLE: RCT (Reactant)  
(reaction of, with aminophenylethanol or  
diethanolamine)

INDEX TERM: 80-62-6  
ROLE: RCT (Reactant)  
(reaction of, with hexamethylenediamine)

L12 ANSWER 2 OF 2 CA COPYRIGHT 1998 ACS  
ACCESSION NUMBER: 94:122000 CA  
TITLE: Carboxylate and sulfonate polyaddition polymers  
AUTHOR(S): Katayama, Shitomi; Koyama, Nobuaki; Iwashita,  
Takeyasu  
CORPORATE SOURCE: Dep. Res. Dev., NHK Spring Co., Ltd., Japan  
SOURCE: Plast. Ind. News (1980), 26(12), 182-9  
CODEN: PINWAE; ISSN: 0032-1206  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
CLASSIFICATION: 35-3 (Synthetic High Polymers)

ABSTRACT:  
Interfacial or soln. polymn. of hexamethylene diisocyanate or  
diphenylmethane 4,4'-diisocyanate with .beta.-alanine or  
.gamma.-aminopropylsulfonic acid derivs. gives polyurea, polyurea  
polyurethanes, or polyurethane electrolytes. The polymer electrolytes  
could be sepd. into water-sol. and water-insol. parts, both of which  
could be dissolved in aprotic polar solvents. The softening points of  
the water-insol. portions are generally higher than those of the  
water-sol. portions. Some elec. resistivities, antistatic properties,



and flocculating and chelating properties are given.

SUPPL. TERM: hexamethylene diisocyanate alanine copolymer  
electrolyte; aminopropylsulfonic acid hexamethylene  
diisocyanate copolymer; diphenylmethane diisocyanate  
aminopropylsulfonic acid copolymer; alanine  
diphenylmethane diisocyanate copolymer; polyurea  
polyurethane electrolyte; polyelectrolyte polyurea  
polyurethane

INDEX TERM: Electric resistance  
(of polyelectrolytes from diisocyanates and  
.beta.-alanine or .gamma.-aminopropylsulfonic acid  
derivs.)

INDEX TERM: Chelating agents and Complexing agents  
Flocculating agents  
(polyelectrolytes, prepn. of)

INDEX TERM: Polyureas  
Urethane polymers, preparation  
ROLE: SPN (Synthetic preparation); PREP (Preparation)  
(prepn. of electrolytic, from diisocyanates and  
.beta.-alanine or .gamma.-aminopropylsulfonic acid  
derivs.)

INDEX TERM: Polyelectrolytes  
(prepn. of, from diisocyanates and .beta.-alanine  
or .gamma.-aminopropylsulfonic acid derivs.)

INDEX TERM: Polymerization  
(interfacial, of isocyanates with .beta.-alanine or  
.gamma.-aminopropylsulfonic acid derivs., for  
polyelectrolytes)

INDEX TERM: Urethane polymers, preparation  
ROLE: SPN (Synthetic preparation); PREP (Preparation)  
(polyurea-, prepn. of electrolytic, from  
diisocyanates and .beta.-alanine or  
.gamma.-aminopropylsulfonic acid derivs.)

INDEX TERM: Polyureas  
ROLE: SPN (Synthetic preparation); PREP (Preparation)  
(polyurethane-, prepn. of electrolytic, from  
diisocyanates and .beta.-alanine or  
.gamma.-aminopropylsulfonic acid derivs.)

INDEX TERM: Polymerization  
(soln., of isocyanates with .beta.-alanine or  
.gamma.-aminopropylsulfonic acid derivs., for  
polyelectrolytes)

INDEX TERM: 4220-47-7P 68147-35-3P 76936-62-4P 76936-65-7P  
ROLE: SPN (Synthetic preparation); PREP (Preparation)  
(prepn. and copolymn. of)

INDEX TERM: 1119-23-9P 64645-91-6P 71526-68-6P 76936-63-5P  
76936-64-6P  
ROLE: RCT (Reactant); SPN (Synthetic preparation);  
PREP (Preparation)  
(prepn. and polymn. of)

INDEX TERM: 68147-06-8P 68147-08-0P 68147-22-8P 68147-26-2P  
68147-28-4P 68147-36-4P 68147-38-6P 68182-28-5P  
68182-29-6P 68253-12-3P 74182-29-9P 76961-31-4P  
76961-33-6P 76961-34-7P 76962-43-1P 76962-45-3P  
76962-47-5P **76962-49-7P** 76962-51-1P  
76962-53-3P 76962-54-4P 76962-55-5P 76984-64-0P  
ROLE: PRP (Properties); SPN (Synthetic preparation);  
PREP (Preparation)  
(prepn. and properties of)

INDEX TERM: 124-09-4, reactions  
ROLE: RCT (Reactant)  
(reaction of, with Me methacrylate or acetonitrile)

INDEX TERM: 104-10-9 111-42-2, reactions  
ROLE: RCT (Reactant)

INDEX TERM: (reaction of, with acrylic acid)  
 79-10-7, reactions  
 ROLE: RCT (Reactant)  
 (reaction of, with diethanolamine or  
 aminophenylethanol)

INDEX TERM: 80-62-6  
 ROLE: RCT (Reactant)  
 (reaction of, with hexamethylenediamine)

INDEX TERM: 1120-71-4  
 ROLE: RCT (Reactant)  
 (reaction of, with hexamethylenediamine and  
 acetonitrile)

INDEX TERM: 75-05-8, reactions  
 ROLE: RCT (Reactant)  
 (reaction of, with hexamethylenediamine and  
 propanesultone)

=> file reg

|  |            |         |
|--|------------|---------|
| COST IN U.S. DOLLARS                       | SINCE FILE | TOTAL   |
|  | ENTRY      | SESSION |
| FULL ESTIMATED COST                        | 5.76       | 107.39  |
| DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS) | SINCE FILE | TOTAL   |
|  | ENTRY      | SESSION |
| CA SUBSCRIBER PRICE                        | -0.92      | -0.92   |

FILE 'REGISTRY' ENTERED AT 12:23:58 ON 31 JAN 1998  
 USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.  
 PLEASE SEE "HELP USAGETERMS" FOR DETAILS.  
 COPYRIGHT (C) 1998 American Chemical Society (ACS)

STRUCTURE FILE UPDATES: 23 JAN 98 HIGHEST RN 200334-60-7  
 DICTIONARY FILE UPDATES: 29 JAN 98 HIGHEST RN 200334-60-7

TSCA INFORMATION NOW CURRENT THROUGH JUNE 1997

Please note that search-term pricing does apply when  
 conducting SmartSELECT searches.

=>

=>

=> s (0-5)/Li and 3/P and 3/O

65802 (0-5)/LI  
 52612 3/P  
 2150755 3/O  
 L13 36 (0-5)/LI AND 3/P AND 3/O

=> d his

(FILE 'HOME' ENTERED AT 12:17:24 ON 31 JAN 1998)

FILE 'REGISTRY' ENTERED AT 12:17:29 ON 31 JAN 1998

|    |                                 |
|----|---------------------------------|
| L1 | 0 S LI AND FE AND 4/PO          |
| L2 | 0 S LI AND MN AND 4/PO          |
| L3 | 0 S LI AND CO AND 4/PO          |
| L4 | 0 S (0-5)/LI AND 2/FE AND 3/PO4 |
| L5 | 0 S (0-5)/LI AND 2/FE AND 3/PO  |
| L6 | 0 S (0-5)/LI AND 2/V AND 3/PO   |
| L7 | 0 S (1-6)/LI AND 2/TI AND 3/PO  |
| L8 | 0 S LI AND 4/PO                 |

L9 58 LI AND P AND 4/O  
L10 633856 MN OR FE OR CO OR NI  
L11 1 S L9 AND L10

FILE 'CA' ENTERED AT 12:23:07 ON 31 JAN 1998  
L12 2 S L11

FILE 'REGISTRY' ENTERED AT 12:23:58 ON 31 JAN 1998  
L13 36 S (0-5)/LI AND 3/P AND 3/O

=> s l13 and l10

L14 3 L13 AND L10

=> d l14

L14 ANSWER 1 OF 3 REGISTRY COPYRIGHT 1998 ACS  
RN 180921-41-9 REGISTRY  
CN Lithium nickel metaphosphate oxide (LiNi2(PO3)3O) (9CI) (CA INDEX  
NAME)  
MF Li . Ni . O3 P . O  
AF Li Ni2 O10 P3  
CI TIS  
SR CA  
LC STN Files: CA, CAPLUS

| Component | Ratio | Component<br>Registry Number |
|-----------|-------|------------------------------|
| O         | 1     | 17778-80-2                   |
| O3P       | 3     | 15389-19-2                   |
| Ni        | 2     | 7440-02-0                    |
| Li        | 1     | 7439-93-2                    |

1 REFERENCES IN FILE CA (1967 TO DATE)  
1 REFERENCES IN FILE CAPLUS (1967 TO DATE)

=> file ca

| COST IN U.S. DOLLARS                       | SINCE FILE<br>ENTRY | TOTAL<br>SESSION |
|--|---------------------|------------------|
| FULL ESTIMATED COST                        | 17.56               | 124.95           |
| DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS) | SINCE FILE<br>ENTRY | TOTAL<br>SESSION |
| CA SUBSCRIBER PRICE                        | 0.00                | -0.92            |

FILE 'CA' ENTERED AT 12:35:23 ON 31 JAN 1998  
USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.  
PLEASE SEE "HELP USAGETERMS" FOR DETAILS.  
COPYRIGHT (C) 1998 AMERICAN CHEMICAL SOCIETY (ACS)

Copyright of the articles to which records in this database refer is held by the publishers listed in the PUBLISHER (PB) field (available for records published or updated in Chemical Abstracts after December 26, 1996), unless otherwise indicated in the original publications.

FILE COVERS 1967 - 27 Jan 1998 (980127/ED) VOL 128 ISS 5

This file contains CAS Registry Numbers for easy and accurate substance identification.

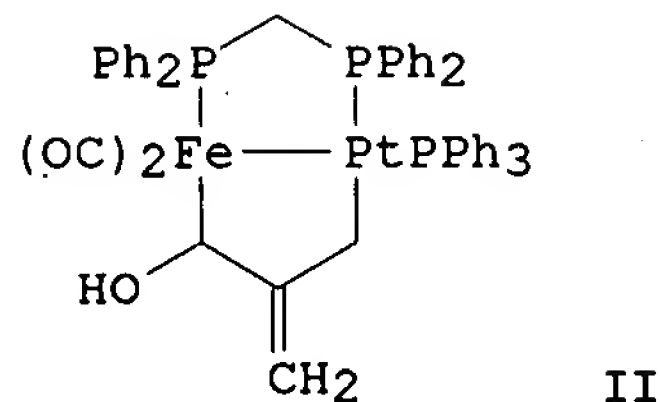
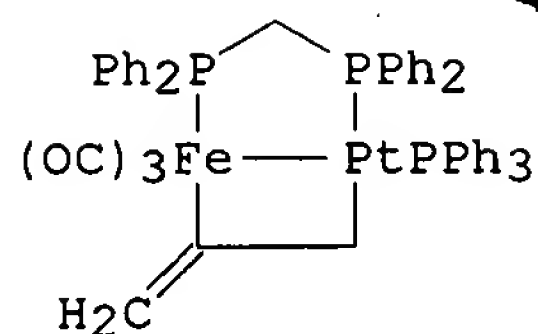
=> s l14\

=&gt; s 114

L16 2 L14

=&gt; d 116 iall 1-2

L16 ANSWER 1 OF 2 CA COPYRIGHT 1998 ACS  
ACCESSION NUMBER: 125:208995 CA  
TITLE: Lithium dicobalt tripolyphosphate and lithium  
dinickel tripolyphosphate  
AUTHOR(S): Erragh, Fatima; Boukhari, Ali; Holt, Elizabeth  
M.  
CORPORATE SOURCE: Dep. Chimie, Univ. Mohammed V, Rabat, Morocco  
SOURCE: Acta Crystallogr., Sect. C: Cryst. Struct.  
Commun. (1996), C52(8), 1867-1869  
CODEN: ACSCEE; ISSN: 0108-2701  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
CLASSIFICATION: 75-8 (Crystallography and Liquid Crystals)  
Section cross-reference(s): 78  
ABSTRACT:  
Isotypic Li dicobalt triphosphate,  $\text{LiCo}_2\text{P}_3\text{O}_{10}$ , and Li dinickel  
triphosphate,  $\text{LiNi}_2\text{P}_3\text{O}_{10}$ , were synthesized and characterized by  
single-crystal x-ray diffraction. These are the 1'st observations of  
nonhydrated mixed-metal tripolyphosphates. The  $\text{P}_3\text{O}_{10}^{5-}$  groups are  
situated on a mirror plane, with successive  $\text{PO}_3$  moieties displaying both  
staggered and eclipsed conformations. Octahedrally coordinated  $\text{Co}^{2+}$  and  
 $\text{Ni}^{2+}$  ions form a staggered chain [Co.cntdot..cntdot..cntdot.Co 3.286(1)  
and 3.133(1) .ANG., Ni.cntdot..cntdot..cntdot.Ni 3.201(1) and 3.023(1)  
.ANG.], with successive metal ions bridged by two O atoms. Crystallog.  
data and at. coordinates are given.  
SUPPL. TERM: structure lithium cobalt nickel tripolyphosphate  
crystal  
INDEX TERM: Crystal structure  
(of cobalt lithium and lithium nickel  
tripolyphosphates)  
INDEX TERM: 180921-40-8, Cobalt lithium metaphosphate  
oxide ( $\text{Co}_2\text{Li}(\text{PO}_3)_3\text{O}$ ) 180921-41-9, Lithium  
nickel metaphosphate oxide ( $\text{LiNi}_2(\text{PO}_3)_3\text{O}$ )  
ROLE: PRP (Properties)  
(crystal structure of)  
  
L16 ANSWER 2 OF 2 CA COPYRIGHT 1998 ACS  
ACCESSION NUMBER: 111:39544 CA  
TITLE: Ring expansion in dimetallacycle chemistry:  
preparation of a dimetallacyclopentanol from a  
dimetallacyclobutane  
AUTHOR(S): Fontaine, Xavier L. R.; Jacobsen, Grant B.;  
Shaw, Bernard L.  
CORPORATE SOURCE: Sch. Chem., Univ. Leeds, Leeds, LS2 9JT, UK  
SOURCE: J. Chem. Soc., Dalton Trans. (1988), (8), 2235-7  
CODEN: JCDTBI; ISSN: 0300-9246  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
CLASSIFICATION: 29-13 (Organometallic and Organometalloidal  
Compounds)  
OTHER SOURCE(S): CASREACT 111:39544; CJRSC  
GRAPHIC IMAGE:



**ABSTRACT:**

Treatment of the dimetallacyclobutane complex I with excess LiBHET<sub>3</sub> followed by MeOH gave 70% dimetallacyclopentanol complex II.

SUPPL. TERM: ferraplatinacyclobutene complex ring expansion reaction; dimetallacyclobutane complex ring expansion reaction; platinaferracyclobutane complex ring expansion reaction; ferraplatinacyclopentanol; platinaferracyclopentanol; dimetallacyclopentanol

INDEX TERM: Ring enlargement  
(of ferraplatinacyclobutane complex, ferraplatinacyclopentanol complex by)

INDEX TERM: **121395-55-9P**  
ROLE: PREP (Preparation)

(formation, NMR, and protonation of)  
INDEX TERM: 121395-54-8P

ROLE: SPN (Synthetic preparation); PREP (Preparation)  
(prepn. and 2-dimensional NMR of)

INDEX TERM: 113288-10-1  
ROLE: RCT (Reactant)  
(ring expansion reaction of, with lithium triethylborohydride or sodium borohydride)

>>> CHANGES TO DWPI COVERAGE - SEE NEWS <<<

=> s rhombohedral Nasicon

179 RHOMBOHEDRAL  
36 NASICON  
L1 1 RHOMBOHEDRAL NASICON  
(RHOMBOHEDRAL(W)NASICON)

=> d 11

L1 ANSWER 1 OF 1 WPIDS COPYRIGHT 1998 DERWENT INFORMATION LTD  
AN 97-536126 [49] WPIDS  
DNN N97-446285 DNC C97-171492  
TI Cathode materials for rechargeable secondary lithium batteries -  
comprising transition metal compounds with ordered olivine or  
**rhombohedral NASICON** structure containing  
phosphate ions..  
DC E31 L03 X16  
IN GOODENOUGH, J B; MASQUELIER, C; NANJUNDASWAMY, K S; PADHI, A  
PA (TEXA) UNIV TEXAS SYSTEM  
CYC 19  
PI WO 9740541 A1 971030 (9749)\* EN 48 pp H01M004-58  
RW: AT BE CH DE DK ES FI FR GB GR IE IT LU MC NL PT SE  
W: CA JP  
ADT WO 9740541 A1 WO 97-US6671 970423  
PRAI US 96-32346 961204; US 96-16060 960423  
IC ICM H01M004-58  
ICS C01B025-26

=> d 11 ab

L1 ANSWER 1 OF 1 WPIDS COPYRIGHT 1998 DERWENT INFORMATION LTD  
AB WO 9740541 A' UPAB: 971211  
Cathode material for a rechargeable electrochemical cell having the  
formula  $\text{LiMPO}_4$  where M is at least one first row transition metal  
cation.  
Also claimed (II) is the material comprising a  
**rhombohedral NASICON** material of the formula  
 $\text{YxM}_2(\text{PO}_4)_3$  where M is a first row transition metal cation and 0 at  
most 0 at most 5 and Y is Li or Na.  
Also claimed (III) is the material comprising a  
**rhombohedral NASICON** material of the formula  
 $\text{YxM}_2(\text{PO}_4)_y(\text{XO}_4)_{3-y}$  where M is a first row transition metal cation  
and 0 at most x at most 5, 0 at most y at most 3, Y is Li or Na, and  
X is Si, As, or S.  
Also claimed (IV) is the material as comprising a  
**rhombohedral NASICON** material of the formula  
 $\text{A}_3\text{-xV}_2(\text{PO}_4)_3$  where A is Li or Na or their combination and 0 at most  
x at most 2.  
Also claimed is a secondary battery including a cathode formed  
from the materials in (I) - (IV)  
USE - Electrodes for secondary lithium batteries.  
ADVANTAGE - Materials are environmentally benign.  
Dwg.0/15

